SEQUENCE LISTING

(1) GENERAL INFORMATION:

   (i) APPLICANT: Lockhart, David J.
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   (ii) TITLE OF INVENTION: NUCLEIC ACID ANALYSIS TECHNIQUES

   (iii) NUMBER OF SEQUENCES: 32

   (iv) CORRESPONDENCE ADDRESS:
       (A) ADDRESSEE: Joe Liebeschuetz
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       (E) COUNTRY: USA
       (F) ZIP: 94111-3834

   (v) COMPUTER READABLE FORM:
       (A) MEDIUM TYPE: Floppy disk
       (B) COMPUTER: IBM PC compatible
       (C) OPERATING SYSTEM: PC-DOS/MS-DOS
       (D) SOFTWARE: PatentIn Release #1.0, Version #1.30

   (vi) CURRENT APPLICATION DATA:
       (A) APPLICATION NUMBER: US 08/882,649
       (B) FILING DATE: 25-JUN-1997
       (C) CLASSIFICATION: 435-006.000

   (vii) PRIOR APPLICATION DATA:
       (A) APPLICATION NUMBER: US 60/010,471
       (B) FILING DATE: 23-JAN-1996

   (vii) PRIOR APPLICATION DATA:
       (A) APPLICATION NUMBER: US 60/035,170
       (B) FILING DATE: 09-JAN-1997

   (viii) ATTORNEY/AGENT INFORMATION:
       (A) NAME: Liebeschuetz, Joe
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       (C) REFERENCE/DOCKET NUMBER: 018547-019410US

   (ix) TELECOMMUNICATION INFORMATION:
       (A) TELEPHONE: (415) 576-0200
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(2) INFORMATION FOR SEQ ID NO:1:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 20 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix)   Features:
        (A) NAME/KEY: PROBE

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

AGCTTTTTTCATGCATCTAT   20

(2) INFORMATION FOR SEQ ID NO:2:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 20 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: PROBE 1

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

AAGCGCGATC GATTATGCTC   20

(2) INFORMATION FOR SEQ ID NO:3:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 43 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: GENE 2

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

ATCTCGGATC GATCGGATAA GCGCGATCGA TTATGCTCGG CGA   43

(2) INFORMATION FOR SEQ ID NO:4:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 12 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: ANCHOR PRIMER
        (B) N = 6-30 T residues in length
        (C) V = A, C or G

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

NVANVGNVCN VT   12

(2) INFORMATION FOR SEQ ID NO:5:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 29 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: PCR Primer

        (B) 3' end has an additional 19-21 gene-specific bases

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GAATTGTAAT ACGACTCACT ATAGGGAGG   29

(2) INFORMATION FOR SEQ ID NO:6:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 29 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

(ix)   Features:
          (A)   NAME/KEY: PCR Primer

          (B)   3' end has an additional 19-21 gene-specific bases

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

AGATGCAATT AACCCTCACT AAAGGGAGA   29

(2) INFORMATION FOR SEQ ID NO:7:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 15 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: YES

     (ix)   Features:
          (A)   NAME/KEY: Figure 15 cDNA strand

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

CVAAAAAAAA AAAAA   15

(2) INFORMATION FOR SEQ ID NO:8:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 16 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: YES

     (ix)   Features:
          (A)   NAME/KEY: figure 15 Anchor Primer

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

GVTTTTTTTT TTTTTT   16

(2) INFORMATION FOR SEQ ID NO:9:

     (i) SEQUENCE CHARACTERISTICS:
          (A) LENGTH: 14 base pairs
          (B) TYPE: nucleic acid
          (C) STRANDEDNESS: single
          (D) TOPOLOGY: linear

     (ii) MOLECULE TYPE: DNA (genomic)

     (iii) HYPOTHETICAL: YES

(ix)   Features:
        (A)   NAME/KEY: Figure 19 labeled poly A tail

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

                                                                                14

AAAATAAAAT AAAA

(2) INFORMATION FOR SEQ ID NO:10:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 30 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: DNA (genomic)

        (iii) HYPOTHETICAL: YES

        (ix)   Features:
                (A)   NAME/KEY: Figure 22 Oligo labeling poly A tail (11mer)

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

                                                                                30

AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA

(2) INFORMATION FOR SEQ ID NO:11:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 11 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: DNA (genomic)

        (iii) HYPOTHETICAL: YES

        (ix)   Features:
                (A)   NAME/KEY: Figure 22 Oligo labeling poly A tail (30mer)

        (xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

                                                                                11

AAAAAAAAAA A

(2) INFORMATION FOR SEQ ID NO:12:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 21 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

        (ii) MOLECULE TYPE: DNA (genomic)

        (iii) HYPOTHETICAL: YES

        (ix)   Features:
                (A)   NAME/KEY: Figure 24 Target sequence

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

TGACATAGGA CAGCGAAGGG A   21

(2) INFORMATION FOR SEQ ID NO:13:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 21-50 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

ACTGTATCCT TTAGCTTCCC TCAGATCACT   30

(2) INFORMATION FOR SEQ ID NO:14:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 21-50 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

ACTGTATCCT TTAACTTCCC TCAGATCACT   30

(2) INFORMATION FOR SEQ ID NO:15:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 134-163 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

ATTAGAAGAA ATGAATTTGC CAGGAAGATG   30

(2) INFORMATION FOR SEQ ID NO:16:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 134-163 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

ATTAGAAGAA ATGAGTTTGC CAGGAAGATG   30

(2) INFORMATION FOR SEQ ID NO:17:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 211-240 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

AGTATGATCA GATACCCATA GAAATCTGTG   30

(2) INFORMATION FOR SEQ ID NO:18:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 211-240 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

AGTATGATCA GATACTCATA GAAATCTGTG   30

(2) INFORMATION FOR SEQ ID NO:19:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 30 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: YES

    (ix) Features:
            (A) NAME/KEY: Figure 32 bases 440-469 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

AGAAATTTGTA CAGAAATGGA AAAGGAAGG   30

(2) INFORMATION FOR SEQ ID NO:20:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 30 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: YES

    (ix) Features:
            (A) NAME/KEY: Figure 32 bases 440-469 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

AGAAATTTGTA CAGRGATGGA AAAGGAAGG   30

(2) INFORMATION FOR SEQ ID NO:21:

        (i) SEQUENCE CHARACTERISTICS:
            (A) LENGTH: 30 base pairs
            (B) TYPE: nucleic acid
            (C) STRANDEDNESS: single
            (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

   (iii) HYPOTHETICAL: YES

    (ix) Features:
            (A) NAME/KEY: Figure 32 bases 621-650 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:21
CATCCCGCAG GGTTAAAAAA GAAAAAATCA   30

(2) INFORMATION FOR SEQ ID NO:22:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 621-650 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:22
CATCCCGCAG GGTCMAAAAA GAAAAAATCA   30

(2) INFORMATION FOR SEQ ID NO:23:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 693-722 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23
TTAGATAAAG ACTTCAGGAA GTATACTGCA   30

(2) INFORMATION FOR SEQ ID NO:24:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 693-722 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:24
TTAGATGAAG ACTTCAGGAA ATATACTGCA   30

(2) INFORMATION FOR SEQ ID NO:25:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 840-867 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:25
TAGAGCCTTT TAGAAAACAA AATCCAGACA   30

(2) INFORMATION FOR SEQ ID NO:26:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 840-867 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:26
TAGAGCCTTT TAGATAACAA AATCCAGACA   30

(2) INFORMATION FOR SEQ ID NO:27:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 872-901 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:27
TATCTATCAA TACATGGATG ATTTGTATGT   30

(2) INFORMATION FOR SEQ ID NO:28:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 872-901 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:28
TATCTATCAA TACGTGGATG ATTTGTATGT   30

(2) INFORMATION FOR SEQ ID NO:29:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 934-963 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:29
CAAAAATAGA GGAACTGAGA CAACATCTGT   30

(2) INFORMATION FOR SEQ ID NO:30:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 934-963 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:30
CAAAAATAGA GGAGCTGAGA CAACATCTGT   30

(2) INFORMATION FOR SEQ ID NO:31:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 960-989 upper sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:31
CTGTTGAGGT GGGGATTTAC CACACCAGAC   30

(2) INFORMATION FOR SEQ ID NO:32:

    (i) SEQUENCE CHARACTERISTICS:
        (A) LENGTH: 30 base pairs
        (B) TYPE: nucleic acid
        (C) STRANDEDNESS: single
        (D) TOPOLOGY: linear

    (ii) MOLECULE TYPE: DNA (genomic)

    (iii) HYPOTHETICAL: YES

    (ix) Features:
        (A) NAME/KEY: Figure 32 bases 960-989 lower sequence

    (xi) SEQUENCE DESCRIPTION: SEQ ID NO:32
CTGTTGAGGT GGGGACTTAC CACACCAGAC   30